

The James Webb Space Telescope

Jonathan P. Gardner

The James Webb Space Telescope is the scientific successor to the Hubble and Spitzer Space Telescopes, and is currently the largest scientific project under construction in the United States. It will be a large (6.6m) cold (50K) telescope launched in about 5 years into orbit around the second Earth-Sun Lagrange point. It is a partnership of NASA with the European and Canadian Space Agencies. Science with the James Webb Space Telescope falls into four themes. The End of the Dark Ages: First Light and Reionization theme seeks to identify the first luminous sources to form and to determine the ionization history of the universe. The Assembly of Galaxies theme seeks to determine how galaxies and the dark matter, gas, stars, metals, morphological structures, and black holes within them evolved from the epoch of reionization to the present. The Birth of Stars and Protoplanetary Systems theme seeks to unravel the birth and early evolution of stars, from infall onto dust-enshrouded protostars, to the genesis of planetary systems. The Planetary Systems and the Origins of Life theme seeks to determine the physical and chemical properties of planetary systems around nearby stars and of our own, and investigate the potential for life in those systems. Webb will have four instruments: The Near-Infrared Camera, the Near-Infrared multi-object Spectrograph, and the Tunable Filter Imager will cover the wavelength range 0.6 to 5 microns, while the Mid-Infrared Instrument will do both imaging and spectroscopy from 5 to 28.5 microns. I will conclude the talk with a description of recent technical progress in the construction of the observatory.